

Moreover, the examination most surprisingly showed that the passivation is strengthened at repeated potential cycles, which is seen in the Figures as the second current peak having a lower value than the first current peak. In Fig. 3a (anodic polarisation), similar results are achieved for the reference material that is denoted A, but in Fig. 3b (cathodic polarisation) this material also exhibits impaired corrosion properties at the second current peak. This is especially interesting as the reference material has 0.4 % by weight nitrogen, and thereby could be expected to react in a similar way as materials 2-1 and 10-1 according to the invention. Moreover, material A has a worse hardness than the two materials according to the invention.

Accordingly, the examination shows that the stainless knife steel according to the invention has the best combination of hardness and corrosion resistance, in comparison with the other examined high- and low-temperature tempered reference steels.

Table 7. Current density ($\mu\text{A}/\text{cm}^2$) at the 450 mV peak.

Type of steel	Heat treatment austenitizing temp./ hardening/tempering	Anodic polarisation	Cathodic polarisation
10-1	1100°C/deep cooling/ 3x1 h at 460 °C	130 (1 st) 50 (2 nd)	≤ 10 (1 st) ≤ 10 (2 nd)
2-1	1100°C/deep cooling/ 3x1 h at 460 °C	130 (1 st) 10 (2 nd)	≤ 10 (1 st) ≤ 10 (2 nd)
A _{LT}	1025°C/oil quenching/2 h at 150 °C	800 (1 st) 460 (2 nd)	≤ 10 (1 st) ≤ 10 (2 nd)
A _{HT}	1025°C/oil quenching/2 h at 500 °C	960 (1 st) 2280 (2 nd)	630 (1 st) 1120 (2 nd)
B _{LT}	1050°C/oil quenching/2 h at 180 °C	400 (1 st) ≤ 10 (2 nd)	≤ 10 (1 st) ≤ 10 (2 nd)
B _{HT}	1050°C/oil quenching/2 h at 500 °C	720 (1 st) 1600 (2 nd)	160 (1 st) 160 (2 nd)
G _{LT}	1050°C/oil quenching/2 h at 160 °C	1110 (1 st) 2700 (2 nd)	520 (1 st) 700 (2 nd)

The polarisation has been measured for two cycles, in order to investigate if the passivation was strengthened or impaired. If the second value is the lowest, the passivation was strengthened.

5 HOT DUCTILITY

The hot ductility of material 10-1, within the temperature range 900-1210 °C, is shown in Fig. 4. Test dimension Ø15x85mm, rate of elongation 6.6 s⁻¹, increasing temperature for $T \geq 1120^{\circ}\text{C}$ and decreasing temperature for $T \leq 1120^{\circ}\text{C}$.